

Message Text

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EXCON

E.O. 11652: XGDS-1

TAGS: ESTC, COCOM

SUBJECT: COCOM LIST REVIEW: IL 1355, SEMI-CONDUCTOR
MANUFACTURING EQUIPMENT

FOLLOWING ARE INTELLIGENCE COMMENTS ON VARIOUS POINTS
RAISED DURING TWG DISCUSSION US PROPOSAL FOR USE DURING
FOURTH ROUND DISCUSSIONS. (MEMORANDUM POUCHED BUT MAY
NOT ARRIVE IN TIME FOR DISCUSSIONS.) THE ANALYST HAS
INDICATED BY CITING THE SPECIFIC PARAGRAPH IN THE
ADDENDUM TO COCOM DOC REV (74)1355/5 WHERE AVAILABLE
INTELLIGENCE DIFFERS FROM STATEMENTS MADE BY THE UK AND
FRENCH DELEGATES. THE INFORMATION HAS BEEN SANITIZED TO
PERMIT PASSAGE TO OTHER COCOM MEMBERS.

1. PAGE 1, PARAGRAPH 4, ITEM B-1-I, WAFER PROCESSING
EQUIPMENT: WE CANNOT SUPPORT THE CLAIM THAT 60MM
DIAMETER WAFER PROCESSING EQUIPMENT IS "IN COMMON USE"
IN THE COMMUNIST COUNTRIES. SUCH EQUIPMENT HAS ONLY
RECENTLY BEEN DESCRIBED IN TECHNICAL LITERATURE PUBLISHED

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BY THE USSR AND EAST EUROPEAN COUNTRIES. WE KNOW OF NO

SOVIET SEMICONDUCTOR PLANT THAT HAS SHIFTED TO 60MM, OR LARGER, DIAMETER WAFERS. THE BULK OF SOVIET SEMICONDUCTOR PRODUCTION USES 40MM TO 50MM DIAMETER WAFERS.

2. PAGE 3, PARAGRAPH 2, ITEM B-1-V, DIFFUSION FURNACES: WE CANNOT SUPPORT THIS CLAIM. THE USSR AND EAST GERMANY ARE THE ONLY COUNTRIES WHICH HAVE ADVERTISED NEW DIFFUSION FURNACES (ONE EACH) WITH TUBE DIAMETERS OF 90MM, OR LARGER. HOWEVER, THESE MODELS ARE RELATIVELY NEW (SINCE 1972), AND HAVE NOT BEEN IDENTIFIED IN WIDE USE THROUGHOUT SOVIET OR EASTERN EUROPEAN SEMICONDUCTOR PLANTS. MOST DIFFUSION FURNACES OF SOVIET OR EASTERN EUROPEAN MANUFACTURE SPECIFY TUBE DIAMETERS OF 70MM OR LESS. ALSO, THE CONTINUED STRONG EFFORTS BY THE COMMUNIST COUNTRIES TO PURCHASE WESTERN FURNACES, PARTICULARLY MULTI-TUBE LARGE DIAMETER MODELS, INDICATE LIMITED AVAILABILITY AND/OR PERFORMANCE OF SOVIET AND EAST GERMAN MODELS.

3. PAGE 4, PARAGRAPH 4, ITEM B-2-I, MEASURING EQUIPMENT: THERE IS VERY LITTLE CURRENT INFORMATION ON EQUIPMENT OF THIS TYPE. OLDER MODELS OF EQUIPMENT (1969) OF SOVIET MANUFACTURE ARE KNOWN, BUT FROM LIMITED TECHNICAL DATA THESE APPEAR TO BE BENCH-TOP SYSTEMS BASED ON MANUAL OPERATION.

4. PAGE 4, PARAGRAPH 5, ITEM B-2-II, SLICE INSPECTION STATIONS AND HANDLING EQUIPMENT: WE CAN NEITHER CONFIRM NOR DENY THIS STATEMENT. HOWEVER, FROM AVAILABLE INFORMATION ON SOVIET SEMICONDUCTOR PLANT FACILITIES THERE IS NO EVIDENCE OF ANY AUTOMATIC EQUIPMENT OF THIS TYPE.

5. PAGE 4, PARAGRAPH 6, ITEM B-2-III, AUTOMATIC OR SEMIAUTOMATIC WAFER PROBES: THIS IS A RELATIVELY NEW ITEM, FIRST IDENTIFIED IN MID- TO LATE 1974. WHETHER THIS ITEM IS IN PRODUCTION OR AVAILABLE FOR USE, IS UNKNOWN. HOWEVER, PAST EXPERIENCE DEMONSTRATES THAT BROCHURE INFORMATION ON A NEW ITEM OF EQUIPMENT IS AN UNRELIABLE INDICATOR OF WHAT IS IN PRODUCTION OR

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AVAILABLE FOR USE IN EAST EUROPEAN COUNTRIES. MOREOVER, SOVIET PROBE TESTERS CURRENTLY IN USE ACCORDING TO BROCHURES HAVE A CLAIMED ACCURACY OF PLUS OR MINUS 5 MICRONS; IN ACTUAL USE ACCURACY HAS BEEN REPORTED TO BE NO BETTER THAN 20 MICRONS.

6. PAGE 5, PARAGRAPH 3, ITEM B-2-VI(F), TESTERS: WE HAVE NO INFORMATION ON THE PRODUCTION OF INDIGENOUS

TESTERS FOR DEVICES OF MORE THAN 16 TERMINALS. HOWEVER, WE MUST POINT OUT THAT ONE OF THE MOST FREQUENTLY SOUGHT ITEMS BY ALL OF THE COMMUNIST COUNTRIES CONTINUES TO BE IC TESTERS AND, IN PARTICULAR, TESTERS CAPABLE OF TESTING ICS HAVING MORE THAN 16 TERMINALS.

7. PAGE 5, PARAGRAPH 5, ITEM B-3-I, SEMIAUTOMATIC BONDERS AND WELDERS: A NUMBER OF COMMUNIST-MADE BONDERS HAVE BEEN IDENTIFIED WHICH ARE DESCRIBED AS SEMI-AUTOMATIC. WE WOULD ADD, HOWEVER, THAT THE VERY BEST OF THESE SEMIAUTOMATIC BONDERS HAVE RATED THROUGH-PUTS (BONDS PER HOUR) WHICH ARE ABOUT 1/2 THE THROUGH-PUT OF US SEMIAUTOMATIC BONDERS.

8. PAGE 6, PARAGRAPH 4, ITEM B-5-I(A) AND (B), PHOTO REPEATERS AND PATTERN GENERATORS: THE SOVIET 3M-508 IS CLEARLY INFERIOR TO WESTERN-MADE EQUIPMENT. THE 3M-508 WORKING FIELD IS A VERY POOR 40 X 40MM, ACCURACY OF PLUS OR MINUS 1.5 MICRONS, MAXIMUM SPEED OF ONLY 3MM A SECOND, AND READING SPEED OF ONLY 50 CHARACTERS PER SECOND. MOREOVER, RECENT INFORMATION INDICATES THAT HIGHLY ADVANCED EQUIPMENT SUCH AS PHOTO REPEATERS AND PATTERN GENERATORS ARE HIGH ON THE SOVIET SHOPPING LIST. ALTHOUGH THE USSR HAS RECENTLY DESCRIBED SIMILAR EQUIPMENT IN TECHNICAL BROCHURES, THE SOVIETS CONTINUE, THROUGH ALL AVAILABLE MEANS, TO PURCHASE WESTERN EQUIPMENT -- EVEN WHEN IT REQUIRES A VERY SUBSTANTIAL MARK-UP OVER MARKET PRICE.

9. PAGE 7, PARAGRAPH 1, ITEM B-5-I(D), DIGITIZERS: WE HAVE NO INFORMATION ON ANY COMMUNIST-MADE EQUIPMENT OF THIS TYPE WITH A WORKING AREA OF 400 SQUARE INCHES AND RESOLUTION OF 25 MICRONS. ONE EAST GERMANY MODEL HAS
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A RESOLUTION OF 30 MICRONS, HOWEVER, ITS WORKING AREA IS ABOUT 175 SQUARE INCHES. IF BETTER MODELS EXIST, WE HAVE NO INFORMATION ON THEM.

10. PAGE 7, PARAGRAPH B-5-V(A), INSPECTION MACHINES: WE HAVE NO INFORMATION ON THE EAST GERMAN MACHINE MENTIONED. MOREOVER, WE KNOW OF NO OTHER COMMUNIST-MADE MACHINES OF THIS TYPE WHICH WOULD QUALIFY AS "GOOD OR BETTER" THAN THE PROPOSED CUT-OFF.

11. PAGE 7, PARAGRAPH 10, ITEM 5-VIII, AUTOMATIC OR SEMIAUTOMATIC ALIGN AND EXPOSE EQUIPMENT: EAST GERMANY AND THE USSR ARE KNOWN TO PRODUCE MASK ALIGNMENT EQUIPMENT. HOWEVER, FROM PHYSICAL EXAMINATION OF INTEGRATED CIRCUITS MADE IN COMMUNIST COUNTRIES IT

IS KNOWN THAT MASK ALIGNMENT REMAINS A PROBLEM. EAST
GERMAN MASK ALIGNERS, IN PARTICULAR, HAVE BEEN
DESCRIBED AS POOR. THE FACT THAT THE USSR IS WILLING TO
PAY HIGH MARK-UPS IN PRICE FOR LARGE QUANTITIES OF
WESTERN MASK ALIGNERS FURTHER SUPPORTS THE CONCLUSION
THAT COMMUNIST-MADE EQUIPMENT IS IN SHORT SUPPLY AND/OR
IS OF UNSATISFACTORY PERFORMANCE. KISSINGER

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